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Low-Luminosity Early-Type Galaxies in the NGC 128 Group

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Abstract. We present spatially resolved kinematics and stellar population parameters for three low-luminosity galaxies in the NGC 128 group obtained by means of 3D spectroscopy. We briefly discuss their evolutionary scenarii.

1. Introduction

The NGC 128 group (d=57 Mpc) includes (spectroscopically confirmed): giant gas-rich S0 NGC 128 with a peanut-shaped bulge, giant Sa NGC 125, 3 low-luminosity S0 closer than 100 kpc in projection to NGC 128: NGC 126 (M_B=-18.5, 61 kpc), NGC 127 (M_B=-18.6, 14 kpc), and NGC 130 (M_B=-19.0, 16 kpc), and several late-type spirals beyond 300 kpc. NGC 128 is known to have a gaseous disc counter-rotating to the stars (Emsellem & Arsenault, 1997).

2. Observations. Data Analysis. Results

We have obtained observations for NGC 126, 127, and 130 in 2005 and 2006 with the MPFS IFU spectrograph at the 6-m telescope of SAO RAS. Using a novel stellar population fitting technique (Chilingarian et al. 2005, 2006, 2007a, Prugniel et al. 2005) we have derived maps of the stellar population parameters (age and metallicity) and internal kinematics of stars and ionised gas.

NGC 126 contains a prominent bar seen on direct images. It appears as a S-shaped structure on the velocity field. No emission lines are seen in the fitting residuals. **NGC 127** is a gas-rich object with early-type morphology and ongoing star formation: strong emission lines are observed. Hβ has been used to recover velocity field of the ionised gas showing faster rotation ($\sim$100 km/s) than stars ($\sim$50 km/s), and asymmetry on the SE part of NGC 127 (direction

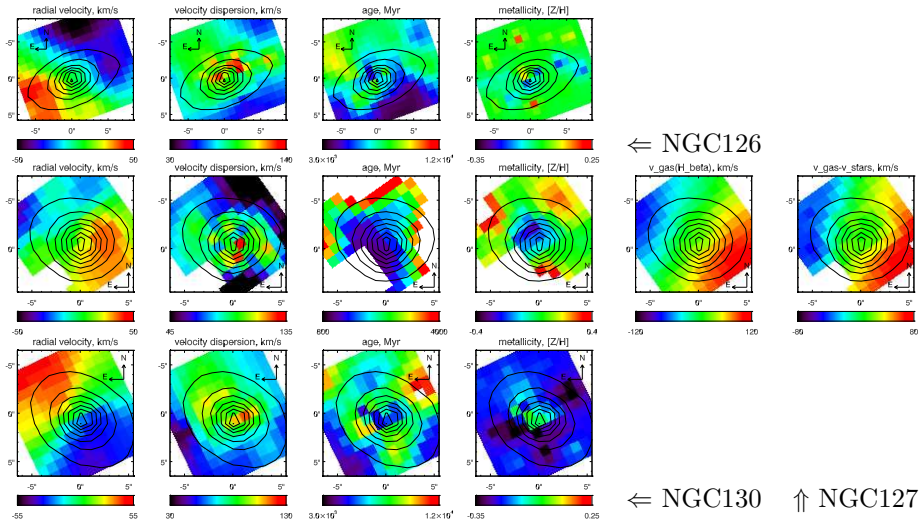

Figure 1. Internal kinematics and stellar populations of three galaxies. Radial velocity, velocity dispersion, age and metallicity maps are shown for all three galaxies. Velocity field of ionised gas (Hβ) and difference between velocities of gas and stars are shown for NGC 127 (middle row, right).

of NGC 128) that may be caused by perturbed motions of the gas near the region, where the accreting flow reaches NGC 127. **NGC 130** located at nearly the same projected distance is very different. Relatively old stellar population, regular kinematics and absence of ionised gas suggest it is located much further from NGC 128. NGC 130 exhibits a spatially unresolved young nucleus (Δt=4 Gyr) reminiscent of young central structures observed in bright Virgo cluster dE galaxies (Chilingarian et al. 2007b).

3. Discussion

While NGC 126 and 130 look similar to cluster dS0/S0's, NGC 127 is a star-forming galaxy with unusual kinematics of gas and a bridge connecting it to NGC 128. We propose the following scenario: NGC 127 has recently passed its pericentre, and now we observe an infall of gas from NGC 128 onto NGC 127. After gas removal and several Gyr of passive evolution it will fade down and would be indistinctive from "normal" dE galaxies by morphology and luminosity.

References

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